

OIE Reference Laboratory Reports Activities

Activities in 2019

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Name of disease (or topic) for which you are a designated OIE Reference Laboratory:	Foot and mouth disease
Address of laboratory:	Xujiaping No.1, Yanchangpu Lanzhou, Gansu province 730046 CHINA (PEOPLES REP. OF)
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Name (including Title) of Head of Laboratory (Responsible Official):	Dr.Hong Yin, Director General of Lanzhou Veterinary Research Institute,CAAS
Name (including Title and Position) of OIE Reference Expert:	Dr.Xiangtao Liu,deputy director of Lanzhou Veterinary Research Institute;head of the national reference laborratory for FMD
Which of the following defines your laboratory? Check all that apply:	Governmental Research Academic

ToR 1: To use, promote and disseminate diagnostic methods validated according to OIE Standards

1. Did your laboratory perform diagnostic tests for the specified disease/topic for purposes such as disease diagnosis, screening of animals for export, surveillance, etc.? (Not for quality control, proficiency testing or staff training)

Yes

Diagnostic Test	Indicated in OIE Manual (Yes/No)	Total number of test performed last year	
		Nationally	Internationally
Indirect diagnostic tests		Nationally	Internationally
LPB-ELISA(type O)	yes	2850	0
LPB-ELISA(type Asia1)	yes	1330	0
LPB-ELISA(type A)	yes	2850	0
NSP-3ABC ELISA	yes	2850	0
Direct diagnostic tests		Nationally	Internationally
Virus isolation	yes	14	0
Antigen typing ELISA	yes	23	0
Real Time-RT-PCR	yes	2592	0
VP1 sequencing	yes	64	0

**ToR 2: To develop reference material in accordance with OIE requirements, and implement and promote the application of OIE Standards.
To store and distribute to national laboratories biological reference products and any other reagents used in the diagnosis and control of the designated pathogens or disease.**

2. Did your laboratory produce or supply imported standard reference reagents officially recognised by the OIE?

No

3. Did your laboratory supply standard reference reagents (non OIE-approved) and/or other diagnostic reagents to OIE Member Countries?

Yes

Type of reagent available	Related diagnostic test	Produced/ provide	Amount supplied nationally (ml, mg)	Amount supplied internationally (ml, mg)	No. of recipient OIE Member Countries	Region of recipients
Guinea pig antisera (against FMDV type O,Asia1 and A)	ELISA	produced	15ml	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV infected sera	ELISA	produced	20	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV referenece cell culture(inactivated)	PCR	produced	150	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMD LBP-ELISA kit(Type O,A,Asia1)	ELISA for FMDV Antibody detection	produced	11256	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV-NSP 3ABC LISA kit	ELISA for FMDV NSP Antibody detection	produced	1643	1kit	2	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

SPCE(type A, O; pilot)	ELISA for FMDV Antibody detection	produced	193	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Conventional MultRT-PCR	RT-PCR for FMDV RNA detection	produced	56	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMDV real time RTPCR kit	qRT-PCR for FMDV molecular detection	produced	918	0	1	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
Typing real-time RTPCR	QRT-PCR for FMDV RNA detection, type O,A and Asia1	produced	234	primers and probes	3	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

4. Did your laboratory produce vaccines?

No

5. Did your laboratory supply vaccines to OIE Member Countries?

No

ToR 3: To develop, standardise and validate, according to OIE Standards, new procedures for diagnosis and control of the designated pathogens or diseases

6. Did your laboratory develop new diagnostic methods validated according to OIE Standards for the designated pathogen or disease?

Yes

7. Did your laboratory develop new vaccines according to OIE Standards for the designated pathogen or disease?

Yes

Name of the new test or diagnostic method or vaccine developed	Description and References (Publication, website, etc.)
Swine Foot and Mouth Disease(type O and A)Bivalent Vaccine,Inactinete(StrainO/MYA98/BY/2010+Strain O/PanAsia/TZ/2011+Strain Re-A/WH/09)	No. 145, Official Announcement, MARA, China http://www.moa.gov.cn/nybgb/2019/0201903/201905/t20190525_6315387.htm
Foot and Mouth Disease Type O and Type A Bivalent 3B Protein Epitopes Deletion Vaccine □Strain O/rV-1 + Strain A/rV-2□□Inactivated	No. 207, Official Announcement, MARA, China http://www.moa.gov.cn/govpublic/xmsyj/201908/t20190828_6323307.htm
Biom mineralization improved the thermostability of foot-and-mouth disease virus-like particles and protective immune response	Nanoscale, 2019,11, 22748-22761 https://doi.org/10.1039/C9NR05549E

ToR 4: To provide diagnostic testing facilities, and, where appropriate, scientific and technical advice on disease control measures to OIE Member Countries

8. Did your laboratory carry out diagnostic testing for other OIE Member Countries?

No

9. Did your laboratory provide expert advice in technical consultancies on the request of an OIE Member Country?

Yes

Name of the OIE Member Country receiving a technical consultancy	Purpose	How the advice was provided
CHINA (PEOPLE'S REP. OF)	FMD vaccination and PVM in 2019 in China	meeting, draft plan
CHINA (PEOPLE'S REP. OF)	FMD Active surveillance in 2019 in China	training courses, meetings, draft plan
THAILAND	FMD sero-typing diagnosis and FMD control measures	meeting/visiting
PAKISTAN	FMD vaccines and vaccination	meeting/visiting
KOREA (DEM. PEOPLE'S. REP. OF)	FMD diagnosis and control in DPRK	meeting/visiting
KAZAKHSTAN	FMD diagnostic technology training	visiting/training

ToR 5: To carry out and/or coordinate scientific and technical studies in collaboration with other laboratories, centres or organisations

10. Did your laboratory participate in international scientific studies in collaboration with OIE Member Countries other than the own?

Yes

Title of the study	Duration	Purpose of the study	Partners (Institutions)	OIE Member Countries involved other than your country
Research and development of an attenuated edible FMD vaccine using salmonella as the vector	3 years	Research and development of an attenuated edible FMD vaccine using salmonella as the vector	Korea Atomic Energy Research Institute/Prof. Seo HoSeong	KOREA (REP. OF)
Cooperative creation and application studies of new products for prevention and control of major transboundary animal diseases	3 years	Cooperative creation and application studies of new products for prevention and control of major transboundary animal diseases	Kazakh National Agrarian University, Kazakhstan/Prof. Gulnaz Ilgekbayeva	KAZAKHSTAN
Immunological modification and mechanism of DC-recruiting foot-and-mouth disease virus-like particles	3 years	Research and development of FMD viral like particle (VLP) fused with the specific DC targeting domain	Korea Atomic Energy Research Institute/Prof. Seo HoSeong	KOREA (REP. OF)
Exchange of vaccine technology for the delivery of oral vaccines to mucosal surface	3 years	To explore the potential of plants and OMVs for production of antigens for oral Vaccination	University of East Anglia	UNITED KINGDOM

ToR 6: To collect, process, analyse, publish and disseminate epizootiological data relevant to the designated pathogens or diseases

11. Did your Laboratory collect epizootiological data relevant to international disease control?

Yes

If the answer is yes, please provide details of the data collected:
1)5 FMD outbreaks notified and reported to OIE; 2)epidemic strains' information shared with OIE/FAO FMDRL network members; 3)Surveillance results provided online by MARA, official veterinary Bulletin

12. Did your laboratory disseminate epizootiological data that had been processed and analysed?

Yes

If the answer is yes, please provide details of the data collected:
report or sharing FMD epidemic situation in international meeting

**13. What method of dissemination of information is most often used by your laboratory?
(Indicate in the appropriate box the number by category)**

a) Articles published in peer-reviewed journals: 12
Published in Chinese Veterinary Science (in Chinese)

b) International conferences: 11
Experts or participants from LVRI, reported the current situation of FMD in China, exchange the information with other laboratories at the international meetings including SEACFMD NCP meeting 2019, OIE/FAO FMD network meeting 2019, SEACFMD LABnet meeting and other FAO/OIE organised meetings.

c) National conferences: 13
The national conferences on FMD control and prevention, vaccine and vaccination, diagnosis technique and the training courses at national(1), regional(3) and provincial level(9), respectively.

d) Other:
(Provide website address or link to appropriate information) 9
Official veterinary bulletin, published by MARA, China.
<http://www.cadc.net.cn/sites/MainSite/tzgg/sygb/>

**ToR 7: To provide scientific and technical training for personnel from OIE Member Countries
To recommend the prescribed and alternative tests or vaccines as OIE Standards**

14. Did your laboratory provide scientific and technical training to laboratory personnel from other OIE Member Countries?

Yes

a) Technical visits: 13
b) Seminars: 360
c) Hands-on training courses: 35
d) Internships (>1 month): 1

Type of technical training provided (a, b, c or d)	Country of origin of the expert(s) provided with training	No. participants from the corresponding country
a	China	13
b	China	360
c	China	35
d	China	1

ToR 8: To maintain a system of quality assurance, biosafety and biosecurity relevant for the pathogen and the disease concerned

15. Does your laboratory have a Quality Management System?

Yes

Quality management system adopted	Certificate scan (PDF, JPG, PNG format)
ISO/IEC 17025:2017	17025-EN-web.jpg
CMA	□□□□□□.pdf

16. Is your quality management system accredited?

Yes

Test for which your laboratory is accredited	Accreditation body
LPB ELISA for FMDV antibody detection	CNAS
ELISA for FMDV NSP antibody detection	CNAS
FMDV Antigen detection ELISA	CNAS
RT-PCR for FMDV	CNAS
Real-time RT-PCR for FMDV	CNAS
FMDV 1D Gene sequencing	CNAS
SPC ELISA for FMDV antibody detection	CNAS
virus isolation(VI)	CNAS
virus neutralization test(VNT)	CNAS
FMDV Vaccine safety and efficacy testing	CNAS

17. Does your laboratory maintain a “biorisk management system” for the pathogen and the disease concerned?

Yes

(See Manual of Diagnostic Tests and Vaccines for Terrestrial Animals, Chapter 1.1.4)

ToR 9: To organise and participate in scientific meetings on behalf of the OIE

18. Did your laboratory organise scientific meetings on behalf of the OIE?

No

19. Did your laboratory participate in scientific meetings on behalf of the OIE?

Yes

Title of event	Date (mm/yy)	Location	Role (speaker, presenting poster, short communications)	Title of the work presented
22nd SEACFMD National Coordinators Meeting	07/2019	Ulaanbaatar, Mongolia	Speaker, poster	Regional Laboratory Report, LVRI China
14th FMD Reference Laboratory Network	12/2019	Busan, Korea	Speaker	Report on National/OIE Foot and Mouth Disease reference Laboratory LVRI, China
31th Conference of the OIE regional commission for Asia, the Far East and Oceania	09/2019	Sendai, Japan	Poster	FMD situation and control programme in China
2nd OIE Regional Meeting of OIE Reference Centres in Asia and the Pacific	03/2019	Tokyo, Japan	Speaker	The Chinese National/OIE Reference Laboratory for Foot and Mouth Disease activities and plans
Regional Expert Group Meeting on Foot and Mouth Disease	05/2019	Bangkok, Thailand	Speaker, Expert	How to improve isolation/identification of FMDV : Scientific aspects; How to select representative samples to reference laboratories : A part of the diagnostic process; FMD clinical sample collection protocols for agent identification and serology in CNFMDRL; FMD laboratory Molecular diagnostic technologies in CNFMDRL
2nd Regional Expert Group Meeting on Foot and Mouth Disease	10/2019	Bangkok, Thailand	Speaker, Expert	FMD Serological diagnostic technologies in CNFMDRL
The 12th SEACFMD Labnet Meeting	11/2019	Pakchong, Thailand	Speaker, Chairman and Expert	The current FMD laboratory activities in China

ToR 10: To establish and maintain a network with other OIE Reference Laboratories

designated for the same pathogen or disease and organise regular inter-laboratory proficiency testing to ensure comparability of results

20. Did your laboratory exchange information with other OIE Reference Laboratories designated for the same pathogen or disease?

Yes

21. Was your laboratory involved in maintaining a network with OIE Reference Laboratories designated for the same pathogen or disease by organising or participating in proficiency tests?

Yes

Purpose of the proficiency tests: ¹	Role of your Reference Laboratory (organiser/participant)	No. participants	Participating OIE Ref. Labs/ organising OIE Ref. Lab.
Harmanisation of the tests including FMD Realtime RT-PCR; Ag ELISA; LPBE, SPCE and 3ABC ELISA; VNT with those from other international FMD laboratories	Participant (PTS 2019)	40	OIE/ China National reference laboratory For FMD, China /WRL FMD, UK FMD

¹ validation of a diagnostic protocol: specify the test; quality control of vaccines: specify the vaccine type, etc.

22. Did your laboratory collaborate with other OIE Reference Laboratories for the same disease on scientific research projects for the diagnosis or control of the pathogen of interest?

Yes

Title of the project or contract	Scope	Name(s) of relevant OIE Reference Laboratories
Monitoring and analysis of the genetic and antigenic evolution of the FMDV from China and the region (OIE/FAO FMD Reference lab network MOU and GFRA MOU)	Evaluation of the efficacy of the current vaccine; selection of the new vaccine strains; Effective control of Foot-and-Mouth Disease	The World/OIE reference laboratory for FMD, The Pirbright Institute, UK; GFRA
Testing and validation of the molecular diagnostic methods for recommending application in SEA region	To evaluation the the specificity and sensitivity of FMDV serotyping qRT-PCR, lineage specific qRT-PCR and primers and probes for sequencing methods.	The OIE reference laboratories for FMD in Korea; The OIE regional reference laboratories for FMD in Thailand; The World/OIE reference laboratory for FMD, UK

ToR 11: To organise inter-laboratory proficiency testing with laboratories other than OIE Reference Laboratories for the same pathogens and diseases to ensure equivalence of results

23. Did your laboratory organise or participate in inter-laboratory proficiency tests with laboratories other than OIE Reference Laboratories for the same disease?

Yes

Note: See Interlaboratory test comparisons in: Laboratory Proficiency Testing at: <http://www.oie.int/en/our-scientific-expertise/reference-laboratories/proficiency-testing> see point 1.3

Purpose for inter-laboratory test comparisons ¹	No. participating laboratories	Region(s) of participating OIE Member Countries
Monitoring the diagnosis capacity of the provincial laboratories in China, FMDV and SVA	32	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East
FMD detection proficiency testing	4	<input type="checkbox"/> Africa <input type="checkbox"/> Americas <input checked="" type="checkbox"/> Asia and Pacific <input type="checkbox"/> Europe <input type="checkbox"/> Middle East

ToR 12: To place expert consultants at the disposal of the OIE

24. Did your laboratory place expert consultants at the disposal of the OIE?

Yes

Kind of consultancy	Location	Subject (facultative)
SEACFMD 2021-2025 roadmap	China	Comments and suggestions on SEACFMD 2021-2025 roadmap
Molecular diagnostic technologies and virus characterisation for FMDV	Thailand, SEAC FMD member countries	Provided primers and probes of FMD serotyping qRT-PCR to other OIE reference laboratories for testing and validation; Tested and validated the Specificity and sensitivity of primers and probes from other laboratories; provided protocols and advice on the protocol and the molecular diagnostic algorithm for FMD, Drafted the sample collection and OP fluid/oral swab collection protocols.
The serological testing for the detection of antibodies against FMDV	Thailand, SEAC FMD member countries	Provided advice, comments and suggestions for the serological testing methods validation and application. Led a group discussion.

25. Additional comments regarding your report:

None